

In re: Jari-Matti Karjanmaa  
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### REMARKS

This Amendment is filed in response to the Office Action dated March 20, 2002.

Applicant first notes with appreciation the Examiner's thorough examination of the application as evidenced by the Office Action. In response to the Office Action, Applicant has amended independent Claim 1 to more clearly recite the claimed invention. As discussed in detail below, Applicant respectfully submits that amended independent Claim 1, as well as the claims that depend therefrom, includes recitations that patentably define over the cited references, taken either individually or in combination. In light of this, Applicant respectfully requests reconsideration and allowance of the application.

The Office Action has rejected all of the claims under 35 U.S.C. § 103(a). Specifically, the Office Action has rejected the claims as obvious in light of U.S. Patent No. 5,821,990 to Rudt et al. by itself or in combination with one of the following references: U.S. Patent No. 5,822,070 to Syré; Tappi article by Vickery; U.S. Patent No. 5,011,573 to Niemi; U.S. Patent No. 5,118,195 to Dobbie and U.S. Patent No. 5,696,591 to Bilhorn et al. Applicant respectfully disagrees with these rejections in light of the following comments.

As a first matter, Applicant notes the Office Action's suggestion that the term "exit of the paper machine" in Claim 1 is indefinite. Applicant respectfully disagrees. A paper machine may include many exits between the end of one process and the beginning of a next process. Claims 2 and 3 define some of the possible processes in the paper machine and Claims 4-9 define whether images are taken before or after the processes are performed. As used in the claim, the term "exit of the paper machine" is meant to mean any point where the paper exits one portion of the machine to enter another portion of the machine and/or the final exit point of the machine. These are all positions where the user may wish to monitor the web. Applicant is unaware of any other way to state this point.

With regard to the rejections based on the cited references, Applicant respectfully submits that none of the cited references, taken either individually or in combination, teaches or suggests the step of analyzing images from the thermal camera as the images are captured by the thermal camera on a continual basis in order to detect defects in the paper web based on the images as recited in amended independent Claim 1. Specifically, in the present invention, the

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web is monitored with a thermal camera to continuously control the quality of the web. The actual images themselves are directly analyzed by the person controlling the process. If the controller finds a defect in the web illustrated in the images, the controller begins altering the process parameters immediately to remove those unwanted features he or she found in the web from the images. The idea is that immediately, when something unwanted in the web is discovered from the images provided by the camera, the process is controlled to remove the defects. This is contrary to the cited references. The cited references only use the images as a back up source of information and do not use the images directly and continuously to detect defects in the web. As such, these prior art systems are not adequately robust to provide real time assessment of the web as is required in many modern high-speed systems.

In particular, the Rudt '990 patent discloses a system having a monitoring means (10), which monitors the web, and data received from the monitoring means is converted to a digital form and stored in a data storage means. Further, the system of the Rudt '990 patent provides separate deviation detectors (38), which detect the deviation of a parameter or characteristic feature separately from the monitoring means. Further, when the deviation detectors (38) detect a deviation, the detectors send a deviation signal to inform the control system (46) about the deviation. Only thereafter is the stored digital data from the images taken by the cameras searched to display the defects sensed by the deviation detectors. Importantly, the images from the camera are not used directly and continuously to determine deviations and control or adjust the manufacturing process, as recited in amended independent Claim 1. Instead, the direct control of the process is based on the deviation detectors 38, not the images from the camera. The images from the camera are translated to digital and stored to be used sometime later when a defect is sensed by the deviation detectors 38. In other words, a person using the system of the Rudt '990 patent does not directly and continuously analyze the images from the camera to detect defects in the web, as recited in amended independent Claim 1. The failure of the Rudt '990 patent to directly use the images for control of the papermaking process may make the system of the Rudt '990 patent less robust and less adapted for high-speed manufacture settings.

Combining the Rudt '990 patent with the Syré '070 patent does not render the claims of the present invention obvious. The Rudt '990 patent discloses that the images from the camera

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are used only as secondary data to detect defects in the web. The images are converted to digital form and saved to a storage means and are only used if the deviation detectors sense a defect, instead of using the images, as such, to directly and continuously control the process. Combining the Syré '070 patent to the Rudt '990 patent only leads to a system that receives the images from the cameras, translates them to digital form, and stores them for later possible use and not a system that directly and continuously uses the images to control the process.

Additionally, combining the Vickery article with the Rudt '990 patent would lead to a similar solution to that of the Rudt '990/Syré '070 combination, which means that images from the digital camera would be translated to digital format and saved for possible later use.

Combining the Niemi '573 patent with the Rudt '990 patent would also have a similar result.

In light of this, Applicant respectfully submits that none of cited references, taken either individually or in combination, teaches or suggests the claimed invention. As such, Applicant respectfully submits that amended independent Claim 1, as well as the claims that depend therefrom, is patentable over the cited references.

### CONCLUSION

In view of the amended claim and the remarks presented above, it is respectfully submitted that all of the present claims of the application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required

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therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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Official

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JUN 12 2002

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CLT01/4538478v1

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**Version with Markings to Show Changes Made:**

**In The Claims:**

Please amend Claim 1 as follows:

1. (Amended) A method for monitoring and controlling quality of a paper web being manufactured in a paper machine, comprising:
  - conveying the paper web from an exit of the paper machine and subjecting the paper web to a treatment process;
  - imaging the paper web with a thermal camera on a continual basis;
  - analyzing images from the thermal camera as the images are captured by the thermal camera on a continual basis in order to detect defects in the paper web based on the images; and
  - adjusting at least one of the manufacturing process and the treatment process for the paper web based on the detected defects determined from the images.

CLT01/4538478v1